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FARM CREDIT ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

MARKETING MAINE POTATOES

PURCHASE AND USE OF POTATOES AND SUBSTITUTES
IN HOMES OF BOSTON CONSUMERS

MARCH 4 TO APRIL 6, 1940

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MAR 11 1941

Preliminary Report

By

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and

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COOPERATIVE RESEARCH AND SERVICE DIVISION
in cooperation with
MAINE AGRICULTURAL EXPERIMENT STATION

Miscellaneous
Report No. 27

September 1940

INV. '60

FARM CREDIT ADMINISTRATION

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SUMMARY

Boston consumers of potatoes generally find the peck package a satisfactory unit for retail purchasing. This conclusion is based on research conducted in Boston on behalf of Maine potato producers. (This study was designed to find ways and means of increasing Boston consumers' satisfaction with Maine potatoes and thus strengthening the producer's position in the Boston market.) It was also evident that most small families require packages smaller than a peck, and that in the spring more consumers are likely to prefer small packages. Therefore, any marketing agency servicing Boston consumers should provide both the usual 100-pound and the peck packages and should add the smaller-than-peck packages.

About two-thirds of the consumers bought potatoes within an average week during March and early April when this study was under way. About 92 percent of them made purchases within two weeks. This customary frequency of purchase on the part of Boston consumers is important to a marketing agency because it indicates the possibility of budgeting stock to the extent that the rate of turnover will be rapid, thereby limiting investment and deterioration. At the same time this habit of making frequent purchases means that a large number of retail packages must be handled and moved through the Boston retail market each week. These packages must be prepared by the retailers themselves or by the wholesale and jobbing agencies that furnish their supplies. Distribution of this large volume, in either wholesale or retail packages, imposes a marketing problem which must be taken into consideration. This problem is intensified by the fact that the weekly distribution of potatoes to consumers has a marked peak occurring on Fridays and Saturdays.

This frequency of consumer purchases indicates that a brand of potatoes well established in consumer goodwill would draw consumers into the retail store. Such a brand might be expected to enhance the volume of sales of other retail items. Experience in other fields, however, has indicated that the establishment of a brand in the goodwill of consumers requires a consistent marketing policy directed to this purpose by an adequately equipped marketing organization over a considerable period of time.

The use of potatoes only occasionally was reported by an important percentage of families. Of the 1,709 families reporting, for instance, 12.2 percent reported the use of potatoes at breakfast in only one to three meals per week. At noon this occasional use of potatoes was reported by 36.5 percent of the families, and for the evening meal by 17.4 percent. It is among these users of potatoes who are in the habit of frequently substituting other food items that consumers' satisfaction is of the greatest importance. Such consumers when dissatisfied, for one reason or another, find it very easy to shift from the use of potatoes to competing items.

Families using potatoes were most likely to serve them at the evening meal, as only 4.4 percent omitted them entirely from the evening menu during a week. At the noon meal the percentage not using potatoes was 37.1 and at the morning meal 85.9.

The use of substitutes was least important among the small- and low-income families who found potatoes a wholesome and inexpensive item of food. Among middle-income groups, however, substitution was more prevalent. In these cases, there seemed to be a tendency to increase variety in the diet and at the same time omit the use of potatoes. Among high-income families, a wider variety of other fresh fruit and vegetable items were purchased, but these were added to the diet.

The study showed that substitutes for potatoes were not limited to a few food items, for, in addition to such foods as macaroni and rice, more than a dozen vegetables were mentioned by housewives as substitutes.

Large families used more potatoes at home than small families, but this was not true on a per person basis. As the size of the family increased, the home use of potatoes per person declined. Small families with low incomes were apparently the heaviest users per person. Among other income groups, the association of income and quantity used was inconclusive. Nationalities, however, varied in their average home use of potatoes. The home use of Irish families was found to be the highest, that of the unclassified white group also was high but that of the Jewish families was relatively low.

Baking was the most popular method reported for the preparation of potatoes. To satisfy the demand for potatoes suitable for baking, size and uniformity, freedom from cuts and bruises, and satisfactory interior quality were important characteristics.

Producers of potatoes and the marketing organizations charged with the responsibility of handling their crops should give attention to the most satisfactory varieties from the consumers' point of view, and in doing so should not overlook the consumers' interest in certain kinds of cooking quality. They should also carefully consider the sizes of potatoes and the sizes of packages desired by consumers. All these features combine to increase the consumer's satisfaction, preventing shift away from potatoes by consumers now using them frequently, and checking the spread of this shift among those who use them less often.

MARKETING MAINE POTATOES

Use of Potatoes and Substitutes in Homes of
Boston Consumers, March 4 to April 6, 1940

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Farmers have a very real interest in the satisfaction had by consumers in using their products. Consumer satisfaction has a stimulating influence on demand. When a product satisfies a consumer it tends to occupy a more permanent place in the family budget because the appeal of substitutes is less convincing. As the degree of consumer satisfaction is increased, therefore, the producer's position in the market is strengthened. To this end there is common ground between the producer and the consumer in the practices found in the market. If the producer supplies a satisfactory product, and if marketing agencies are efficient in its distribution, both producers and consumers are likely to be benefited. The equitable division of the rewards, however, is likely to depend on the policies and practices of the marketing organizations.

Note. - The authors wish to acknowledge the contributions of Maynard A. Hincks and the members of the staff of the Maine Agricultural Experiment Station, and of Kelsey B. Gardner and members of the staff of the Cooperative Research and Service Division of the Farm Credit Administration.

Study of consumers' habits and preferences in the use of any product is a necessary basis for efforts to increase consumer satisfaction. Potato producers in Maine, experiencing increased competition in the Boston market, are interested in ways and means by which the Boston demand for Maine potatoes may be strengthened. They are also interested in competition of other food products for a part of what was previously the Maine potato market in Boston. A study of consumers' habits and customs in the purchase and use of potatoes was, therefore, undertaken to discover the characteristics of potatoes which may increase consumer satisfaction, and so enable producers' and other marketing organizations to take appropriate steps to defend themselves in their market against encroaching competition. Some preliminary findings from the study in the Boston market area are reported here and reports on other aspects of the Boston potato market will follow 1/.

GATHERING AND ANALYZING THE DATA

Information was gathered from consumers by licensed Federal-State fruit and vegetable inspectors through personal interviews in households. The households were selected by random procedure from the directories of Boston and 13 cities and towns in the Boston metropolitan area which, according to the census taken by the Commonwealth of Massachusetts in 1935 2/, had a density of population of more than 5,000 persons per square mile.

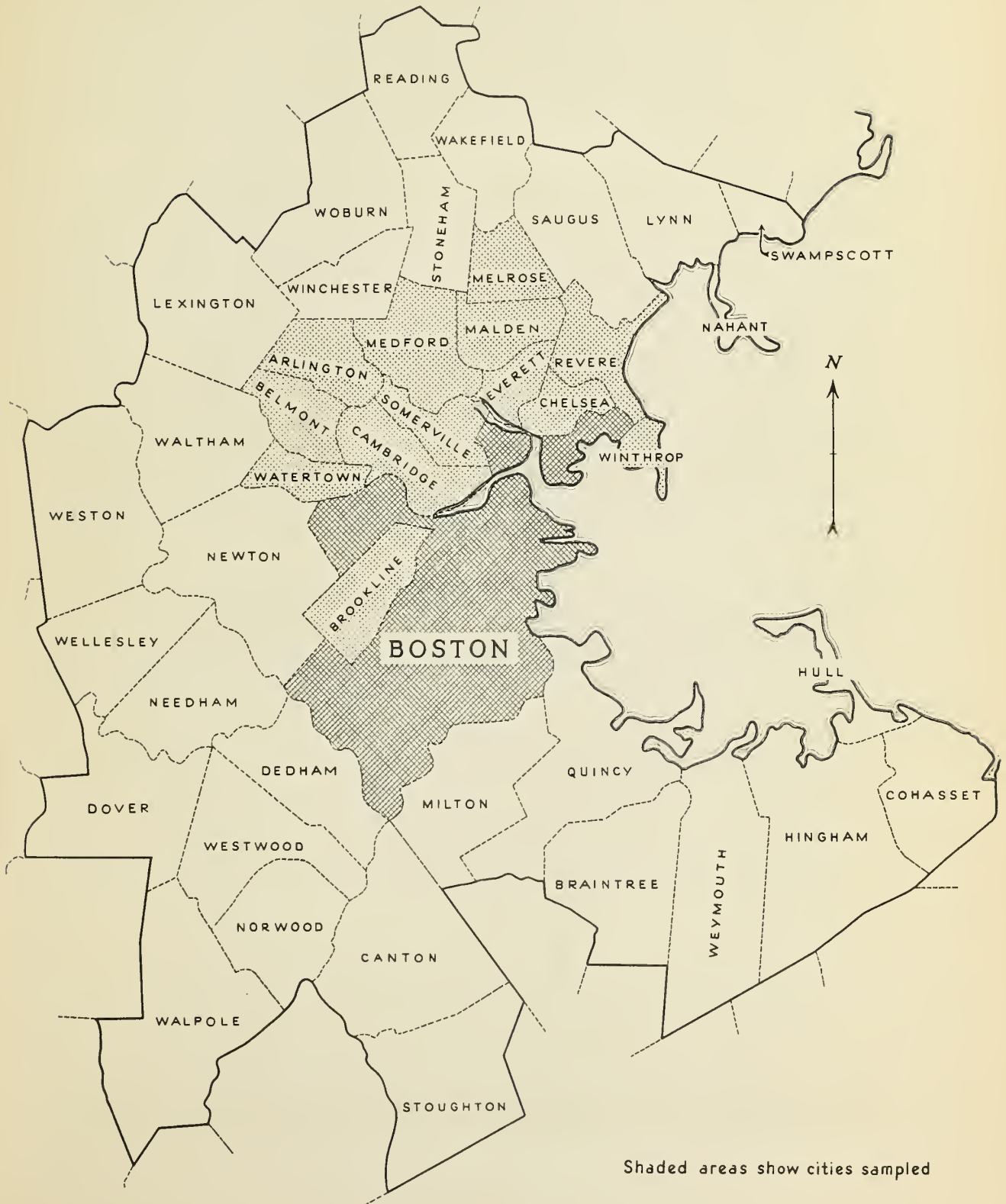
The shaded portion of the outline map, figure 1, illustrates the area in which data were gathered. The number of records taken in each community was apportioned according to the number of families there. For example, 8.2 percent of the total number of families within the sampling area were located in Cambridge, so approximately 8.2 percent of the consumer records were taken in this city.

To obtain facts accurately, the interview was related directly to the last purchase of potatoes. The potatoes still on hand were sized and graded, and the housewife's favorable or unfavorable reactions as to size, cooking qualities, and other characteristics were obtained. To reduce further the errors from faulty recollection, questions about the use of potatoes, the method of preparation, the use of substitutes and of other fruit and vegetable items, were limited to the last 7 days including the day on which the record was obtained.

1/ For additional information from the same research see Hincks, M. A., Marketing Maine Potatoes: I.- A Preliminary Report of Consumer Preference for Potatoes in Boston, March 4 to April 6, 1940. Maine Agr. Expt. Sta. and Maine Development Commission in cooperation with the Cooperative Research and Service Division, Farm Credit Administration, United States Department of Agriculture. 40 pp. 1940 (mimeographed).

2/ The Commonwealth of Massachusetts, Division of Metropolitan Planning. Statistics of the Boston Metropolitan District. 1 p. 1939.

FIGURE 1
Boston Metropolitan District



Data were gathered during the period from March 4 to April 6, 1940. Two separate samples of approximately 900 records each were taken. Comparison of two or more such samples provides a basis for recognizing practices which may develop on the part of enumerators in the gathering of records. It also provides a basis for taking some account of the seasonal change during the sampling period which may develop in buying habits of consumers. Apart from both these reasons, confidence in the data was strengthened because the first and second samples were consistent for such factors as nationality, size of family, and income.

The Native White, the Irish, Italian, Jewish, and Negro groups, from the standpoint of number, were the most important race or nationality groups in Boston and nearby communities. Since it was assumed that the consumption of potatoes would differ among these groups, the enumerators were asked to classify the families interviewed according to the race or nationality of the head of the family. It was also assumed that the number of generations in this country was not important if nationality habits and customs persisted; therefore, an Italian or Jewish family of the second or third generation in this country which retained its racial or national traits was classified as Italian or Jewish - not as Native White.^{3/} The groups designated were Irish, Italian, Jewish, Negro, and Unclassified-White. The last classification included the Native Whites, other nationalities than the predominating groups given above, and some White families who refused to admit foreign origin.

Under "Size of Family" were included all persons in each household with the exception of infants not yet old enough to eat potatoes. Records were not taken of families which included more than two roomers or boarders, since it was considered that such a household was not a typical family.

Family income was a third important population factor because it had a direct influence upon consumer buying habits. Weekly family income, as used in this study, was defined as the salary or wages of the head of the family, plus any other items regularly made available for current living expenses. The monthly rental figure obtained by the enumerators provided a means of estimating weekly family income in those instances when this information was not given directly.

Both size of family and income had racial or national associations. Large families, for instance, were characteristic of a large percentage of the Italians and low income was characteristic of large percentages of both Italians and Negroes.

^{3/} These lived in sections of the city where the group characteristics predominated and gave their information to the enumerator as a part of the nationality group.

Consumers were asked to give the quantity of the last purchase and the day on which it was made. They also gave information on the method of preparing potatoes each day during the past week and the number of meals at which potatoes were served. In addition they gave information as to the substitutes for potatoes as well as the number of other fresh fruit and vegetable items purchased during the previous week.

When such factors as size of family and income are both important, adjustments in the data would be necessary to show the net effect of either since, when both factors are operating, a family of several persons with a large income would not act as a family of the same number with a small income. These differences have not been adjusted in the following pages although frequently, when considered important, such possibilities of change have been noted, together with the type of change which might be expected. In this preliminary report, however, the actual, or gross, relationships are themselves of considerable value and serve to describe the market for purposes of organizing consumer and retailer service. Since this survey was conducted as a study of the market for potatoes and not as a study of consumers from the point of view of consumption alone, it was not considered desirable to make all the adjustments which would be indicated in research for the latter purpose.

SIZE AND FREQUENCY OF PURCHASE

Quantity Last Purchased

Data on size of the last purchase are summarized in table 1. The date of the last purchase, especially for larger lots, was sometimes several weeks previous to the date of enumeration. The first sample showed an average purchase of 19.3 pounds of potatoes per family; the second sample showed an average purchase of 17 pounds per family. This difference is too great to result from sampling procedures alone and indicates a progressive change in size of purchase as the season advanced. About 7 percent of the families included in the first sample were using potatoes bought in packages or bags larger than a peck. Only 3.8 percent of the second sample were doing so. This difference is explainable on the basis of some consumer buying habits. In the fall and early winter, some consumers bought potatoes in 100-pound bags at special retail sales or direct from local producers. Occasionally a consumer bought several of these large packages. As they were used up, however, they were not always replaced by large packages. The more advanced the season, therefore, the smaller the number of consumers using potatoes from these 100-pound bags.

The selection of March and early April as the time for making the survey had an influence on the number of users of 100-pound

packages. The users knew that as spring advances potatoes sprout and get soft, especially when held at ordinary home temperatures 4/, and considered this fact in making their purchases. Many consumers used the last of these large supplies during the period sampled and returned to the purchasing of small packages.

Table 1 shows that the 15-pound or peck-size packages were selected by more than 60 out of every 100 families interviewed. The next most popular size was the 7 1/2-pound or 1/2-peck package reported by about 16 to 18 percent of the consumers interviewed. Eight out of 100 families included in the first sample bought potatoes in quantities less than 1/2 peck; in the second sample the families buying potatoes in small amounts increased to about 11 out of 100. This difference may represent some switching over to new potatoes which were arriving in small quantities from Cuba and from the southern States 5/. It also reflects consumers' desire to purchase old potatoes in smaller packages because of poorer keeping quality as the season advanced.

Table 1.- Quantities of potatoes purchased by 1,763 families reporting, Boston, Mass., March 4 to April 6, 1940

Quantity purchased (pounds)	Families reporting		Percentage of total families	
	First sample	Second sample	First sample	Second sample
	Number	Number	Percent	Percent
110 or more	9	8	1.0	0.9
90-109	32	18	3.7	2.0
50-89	4	1	.5	.1
16-49	17	7	1.9	.8
15	550	589	62.8	66.4
9-14	31	23	3.5	2.6
7-8	159	145	18.2	16.4
4-6	62	70	7.1	7.9
1-3	12	26	1.3	2.9
Total ^{1/}	876	887	100.0	100.0
			Pounds	Pounds
Average quantity purchased			19.3	17.0

1/ Three families in the first sample and 9 families in the second sample did not contribute information regarding the amount of potatoes purchased. Table 1 shows that in the first group of reports, 7.1 percent purchased packages larger than 1 peck. In the second group of records taken about 2 weeks later, only 3.8 percent reported purchase of these larger sized packages.

4/ To prevent sprouting in the spring, potatoes must be held at temperatures of about 57° Fahrenheit or lower.

5/ The relatively high price of new potatoes early in the season and the fact that they do not lend themselves to all methods of preparation tend to cause smaller average purchases of new potatoes than of old ones.

Although it is common practice for retailers to offer potatoes to consumers in certain customary quantities such as $\frac{1}{2}$ peck or 1 peck, it is also true that, if packages of satisfactory size are not available, in many stores consumers can buy potatoes from bulk as desired.

In table 2 are summarized the quantities purchased by families according to income. Large packages usually cost less per pound than small ones but purchases smaller than a peck were reported by larger than average percentages in both low and high income groups. This reflects the tendency of low-income families to forego possible savings because of the total cost of the large package. Family units of one person and Negroes, who represent a small-family low-income group, both contributed to the large percentage of low-income groups buying small packages. The larger proportion of high-income families purchasing small packages suggests that for them, convenience or other factors may be more important than the slightly higher price per pound of the small package. Families of medium income bought small packages in less than average percentages but purchased the more economical peck packages in greater than average percentages.

A much stronger relationship is found in table 3, where size of purchase is classified according to size of family. Small families were likely to buy small packages of potatoes but as the family increased in size, the percentage reporting larger size purchases increased while the percentage making smaller purchases declined.

When classified as in table 4, on the basis of race or nationality, the data showed that a larger percentage of Negroes made small purchases than of any other race or nationality group. This was associated with low incomes and small families among the Negro population of Boston included in this study. The proportion of Irish families buying peck packages exceeded that of any other population group.

The significance of these data lies in their importance to a potato selling agency engaged in consumer or retailer service. There were some purchases of most package sizes in each consumer group. In the fall or early winter some families preferred to purchase larger-than-peck packages because of the lower cost per pound. Peck packages, which combined the factors of convenience and economy, were acceptable to the larger percentage of families in most population groups. As compared with medium-income families, larger percentages of both low- and high-income families bought smaller packages. In the spring, when higher temperatures are likely to cause sprouting as well as other forms of deterioration, there was a shift in demand toward smaller retail packages.

Table 2.- Quantities of Potatoes Purchased by Families in Various Income Groups, Boston, Mass.,
March 4 to April 6, 1940

Weekly income	Purchases made in packages of -				Percentage of purchases in packages of -			
	1-6 pounds	7-14 pounds	15 pounds	16 pounds or more	Total	1-6 pounds	7-14 pounds	15 pounds
	Number	Number	Number	Number	Number	Percent	Percent	Percent
\$15 or less	33	32	25	8	163	19.7	19.0	56.5
\$16 - \$25	44	89	260	21	414	10.6	21.5	62.8
\$26 - \$35	32	98	391	21	542	5.9	18.1	72.1
\$36 - \$45	30	60	210	24	324	9.3	18.5	64.8
\$46 - \$55	18	53	120	15	206	8.7	25.7	58.3
\$56 or more	13	26	67	7	109	11.9	23.9	57.8
Total	170	358	1,139	96	1,763	9.6	20.3	64.6
								5.5
								100.0

Table 3.- Quantities of Potatoes Purchased, by Size of Family, Boston, Mass., March 4 to April 6, 1940

Persons in family	Number of purchases				Percentage of purchases in specified groups			
	1-6 pounds	7-14 pounds	15 pounds	16 pounds or more	Total	1-6 pounds	7-14 pounds	15 pounds
1	17	12	8	0	37	46.0	32.4	21.6
2	76	117	153	10	361	21.0	32.4	43.8
3	30	105	229	17	381	7.9	27.5	60.1
4	19	69	276	13	377	5.0	18.3	73.2
5	16	34	199	15	264	6.0	12.9	75.4
6	7	9	118	15	149	4.7	6.0	79.2
7	3	7	65	13	88	3.4	7.9	73.9
8 or more	2	5	86	13	106	1.9	4.7	81.1
Total	170	358	1,139	96	1,763	9.6	20.3	64.6
								5.5
								100.0

Table 4.- Quantities of Potatoes Purchased by Families Grouped According to Race or Nationality, Boston, Mass., March 4 to April 6, 1940

Race of nationality	Purchases made in packages of -				Total
	1-6 pounds	7-14 pounds	15 pounds	16 pounds or more	
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
Irish	21	63	255	23	362
Italian	25	36	118	12	191
Jewish	20	19	59	5	103
Negro	23	18	27	1	69
Unclassified white	81	222	680	55	1,038
Total	170	358	1,139	96	1,763

Race of nationality	Percentage of purchases in packages of -				Total
	1-6 pounds	7-14 pounds	15 pounds	16 pounds or more	
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Irish	5.8	17.4	70.4	6.4	100.0
Italian	13.1	18.8	61.8	6.3	100.0
Jewish	19.4	18.4	57.3	4.9	100.0
Negro	33.3	26.1	39.1	1.5	100.0
Unclassified white	7.8	21.4	65.5	5.3	100.0
Total	9.6	20.3	64.6	5.5	100.0

Percentage of Families that Bought Potatoes Each Week

Closely associated with the size of package purchased is that of the percentage of families purchasing each week. The size of purchase, for instance, associated with the rate of home use may dictate the frequency with which purchases are made and consequently determines the percentage of families which purchase in any given week. By the same reasoning the average size purchase compared with the percentage of families making such purchases may be used as an indication of their rate of use. In table 5 these percentages are shown for families of various sizes associated with family income. This table shows first that 55.1 percent of the families of 2 persons purchased potatoes each week. It also shows that 66.8 percent of the families of 3 and 4 persons purchased potatoes each week. Similarly, in families of 5 and 6 persons 72.1 percent reported purchases weekly, and in families of 7 or more the percentage was 78.3. As the size of the family increased not only

was the size of the purchase increased, as indicated in table 3, but also the frequency with which such families renewed their supply was greater.

When analyzed according to family income, also shown in table 5, the relationship was not quite so clear. There was some evidence that small families of low income, that is, \$15 per week or less, purchased more frequently than did families of the same size and higher incomes. This relationship, however, seemed to apply only to the relatively small families, because in families of 5 and 6 or more persons the relationship was not at all clear, and in the highest size of family group, there was an indication that the percentage of families buying potatoes in any week increased as income increased.

The data in table 6 indicate that the percentage of Jewish families purchasing each week was usually lower than that for any other race or nationality group, and always less than average. In families of 2 to 6 persons, more of the Negroes purchased potatoes weekly; but in families of 7 or more, the largest percentage making weekly purchases was reported by the Unclassified Whites.

From the foregoing, it appears that wide variation in percentage of families making purchases each week were associated with race or nationality as well as with size of family. There was also some indication that the proportions of families that bought potatoes each week were associated with income and size of family groups. Estimates of potatoes used weekly by these families according to race, nationality, and size of family groups will be presented later in this report.

Table 5.- Families Purchasing Potatoes Each Week, by Incomes in Size-of-Family Groups, Boston, Mass., March 4 to April 6, 1940 ^{1/}

Family income per week	Percentage purchasing each week among families of -			
	2 persons	3 and 4 persons	5 and 6 persons	7 or more persons
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
\$15 or less	62.5	79.2	73.4	77.8
\$16 -- \$25	59.0	70.0	73.8	77.8
\$26 -- \$35	49.4	64.1	73.7	77.8
\$36 -- \$45	57.4	60.3	63.2	73.5
\$46 -- \$55	46.2	71.0	73.6	86.4
\$55 or more	55.6	68.2	65.4	85.7
Total	55.1	66.8	72.1	78.3

^{1/} Families of 1 person omitted because there were too few of them and it was considered undesirable to combine them with families of 2 persons.

Table 6.- Families Purchasing Potatoes Each Week, by Race or Nationality in Size-of-Family Groups, Boston, Mass., March 4, to April 6, 1940 1/

Race or nationality	Percentage purchasing each week among families of -			
	2 persons	3 and 4 persons	5 and 6 persons	7 or more persons
	Percent	Percent	Percent	Percent
Irish	61.3	70.1	72.0	76.2
Italian	63.0	66.7	59.2	66.7
Jewish	28.6	56.0	64.0	50.0
Negro	70.6	86.4	90.9	75.0
Unclassified white	53.8	66.0	74.9	86.2
Total	55.1	66.8	72.1	78.3

1/ Families of 1 person omitted because there were too few of them and it was considered undesirable to combine them with families of 2 persons.

Frequency of Purchase

Of the families interviewed, 66.1 percent had made the last purchase of potatoes within a week of the date of the interview (table 7); 26.4 percent within 8 to 15 days prior to enumeration, and 7.5 percent reported that more than 2 weeks had elapsed since the last purchase.

The fact that 66.1 percent of the consumers reporting had their last purchase within a period of 7 days prior to the date of enumeration does not mean that the 66.1 percent of these consumers who purchased potatoes each week were always the same families. It merely means that in any average week during the period from March 4 to April 6, 66.1 percent of the population of the area surveyed might be expected to purchase potatoes at least once. The time which might elapse before these same consumers called to make another purchase is not indicated. The data in table 7 show, however, that 7.5 percent of the families interviewed made the last purchase more than 2 weeks prior to the date of the interview. This is only one-third of the families purchasing at intervals exceeding 2 weeks. Another third are included in the group reporting their last purchase in the second week previous to the interview, and still another third in the 1-to-7-day group. This being true, the percentage of families characteristically purchasing at 2-week intervals is not 26.4, but this percentage less 7.5 or 18.9 percent. Following this reasoning, the most likely pattern of purchase by Boston consumers in this period is indicated in table 8, which shows estimates of the percentage of (1) families which purchase at least once in each week (2) families which usually purchase at 2-week intervals, and (3) families which purchase potatoes at intervals of more than 2 weeks.

Table 7.- Frequency of Family Purchase of Potatoes, Boston, Mass.,
March 4 to April 6, 1940 ^{1/}

Days since last purchase	Families reporting <u>Number</u>	Percentage of total <u>Percent</u>
1 - 7	1,135	66.1
8 - 15	454	26.4
More than 15	128	7.5
Total	1,717	100.0

^{1/} Table 7 shows that the probability of an average family buying potatoes within any week in March 1940 was about 66 out of 100.

Table 8.- Estimated Interval Since Last Family Purchase of Potatoes,
Boston, Mass., March 4 to April 6, 1940

Days since last purchase	First week <u>Percent</u>	Second week <u>Percent</u>	More than 2 weeks <u>Percent</u>	Total <u>Percent</u>
More than 15	7.5	7.5	7.5	22.5
8 - 15	18.9	18.9		37.8
1 - 7	39.7			39.7
Total	66.1	26.4	7.5	100.0

Approximately 22.5 percent of the consumers interviewed purchased at intervals exceeding 2 weeks, 37.8 percent at intervals of 8 to 15 days, and 39.7 percent at intervals of 1 to 7 days.

As indicated above, there seems to be seasonal variation in the size and frequency of family purchases, probably related to the less satisfactory keeping quality of potatoes in the spring. This tendency on the part of consumers to purchase smaller packages in the spring is further supported in table 9, in which data on size of purchase by the 1,133 families reporting purchase within the past week are shown. In this group of the most recent purchases very few large packages were reported, as a result of which the average purchase for the group is only 13.2 pounds instead of the 17 to 19 pounds reported in table 1. In this group only 2 percent of the purchases exceeded 15 pounds in size.

These data showing the frequency with which consumers buy potatoes indicate that about two-thirds of the families may be

expected to purchase in any given week. Here, as in table 1, the fact that about two-thirds of the population bought one peck at a purchase is shown. The proportion of the population that bought half pecks is also in close agreement. The likelihood of a purchase exceeding a peck, however, is much less at the later date (table 6).

This frequency of purchase has considerable marketing significance. In the first place, it suggests that a brand, if well established in consumer good will, would become an important item in a retail store because of the frequency with which consumers return to make new purchases. In the second place, it shows that a marketing organization for retailer and consumer service would need to be equipped to stock retail packages of several sizes, as well as potatoes in bulk packages. The regularity of the flow and the consumption, however, indicate that these stocks might be carefully budgeted in such a way as to make the rate of turnover rather high. This high rate of weekly turnover also suggests that there is a considerable problem of physical distribution in the weekly delivery of so large a volume of potatoes at the many retail points in Boston, which such a marketing agency would need to serve.

Table 9.- Families Reporting the Purchase of Potatoes Within the Past Week by Quantities Purchased, Boston, Mass., March 4 to April 6, 1940

Quantity purchased (pounds)	Families reporting <u>Number</u>	Percentage of total families <u>Percent</u>
110 or more	---	---
90 - 109	7	.6
50 - 89	1	---
16 - 49	16	1.4
15	754	66.6
9 - 14	35	3.1
7 - 8	194	17.1
4 - 6	97	8.6
1 - 3	29	2.6
Total <u>1/</u>	1,133	100.0

1/ The average purchase for this group was 13.2 pounds. Very few families bought potatoes in amounts greater than 15 pounds during any week immediately preceding an interview in March; therefore, the average size of purchase for this group is not so large as the average purchase for all families reporting the use of potatoes, since many earlier purchases (table 1) were in larger packages. The average purchase per week as derived from the information given in table 9 is 13.2 pounds as compared with 17 to 19.3 pounds in table 1, where the time was not limited to one week and last purchases made several weeks earlier were included.

CONSUMERS' MARKETING DAYS

The enumerators recorded the date on which the last package of potatoes was bought. This information was supplied by 1,695 families and was tabulated to determine on which days of the week the housewife was most likely to make a purchase of potatoes. Some purchases were made on every day of the week - even a few on Sunday - but by far the heaviest concentration was on Saturday, with Friday as the second most popular marketing day.

A summary of this information, by race or nationality groups, in table 10 shows that about one-half of the families interviewed bought potatoes on Saturday, and that about 14 out of 100 housewives bought potatoes on Friday. Among Jewish families, Friday purchases were significantly higher than average, representing purchases by Orthodox Jewish families who observed the Sabbath on Saturday. A relatively large percentage of Negro families bought on days other than Friday and Saturday.

In table 11, the information is classified by size of family groups. It is observed that the very small families and the large families showed less tendency to buy potatoes on Saturday than did families of from 2 to 6 persons, probably because the customary package sizes of potatoes did not coincide with the weekly usage of these families. This table also shows the tendency of very large families to make purchases on Wednesday. This indicates the possibility that some families in this group make purchases twice a week.

Table 10.- Families Buying Potatoes on Specified Days of the Week, by Race or Nationality Groups, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Number of families buying on -							Total
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	Number	Number	Number	Number	Number	Number	Number	
Irish	32	28	34	38	43	170	5	350
Italian	21	17	16	14	27	88	1	184
Jewish	6	12	10	7	20	48	0	103
Negro	8	8	7	3	7	30	0	63
Unclassified white	77	85	101	89	133	503	7	995
Total	144	150	168	151	230	839	13	1,695

Race or nationality	Percentage of families buying on -							Total
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
Irish	9.1	8.0	9.7	10.9	12.3	48.6	1.4	100.0
Italian	11.4	9.2	8.7	7.6	14.7	47.8	.6	100.0
Jewish	5.8	11.7	9.7	6.8	19.4	46.6	.0	100.0
Negro	12.7	12.7	11.1	4.8	11.1	47.6	.0	100.0
Unclassified white	7.7	8.5	10.2	8.9	13.4	50.6	.7	100.0
Total	8.5	8.8	9.9	8.9	13.6	49.5	.8	100.0

Table 11.- Families Buying Potatoes on Specified Days of the Week, by Size of Family Groups, Boston, Mass., March 4 to April 6, 1940

Persons in family	Number of families buying on -							Total
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	Number	Number	Number	Number	Number	Number	Number	Number
1	6	3	3	4	5	14	1	36
2	43	34	29	24	31	178	7	346
3	26	24	33	36	57	192	2	370
4	21	36	30	31	53	193	3	367
5	17	19	23	22	40	124	0	245
6	10	13	15	10	23	74	0	145
7	11	8	12	13	9	31	0	84
8 or more	10	13	23	11	12	33	0	102
Total	144	150	168	151	230	839	13	1,695

Persons in family	Percentage of families buying on -							Total
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1	16.7	8.3	8.3	11.1	13.9	38.9	2.8	100.0
2	12.4	9.8	8.4	6.9	9.0	51.5	2.0	100.0
3	7.0	6.6	8.9	9.7	15.4	51.9	.5	100.0
4	5.8	9.8	8.2	8.4	14.4	52.6	.8	100.0
5	6.9	7.8	9.4	9.0	16.3	50.6	.0	100.0
6	6.9	9.0	10.3	6.9	15.9	51.0	.0	100.0
7	13.1	9.5	14.3	15.5	10.7	36.9	.0	100.0
8 or more	9.8	12.7	22.5	10.8	11.8	32.4	.0	100.0
Total	8.5	8.8	9.9	8.9	13.6	49.5	.8	100.0

Table 12.- Families Buying Potatoes on Specified Days of the Week, by Family Income Groups, Boston, Mass., March 4 to April 6, 1940

Family income	Number of families buying on -							Total
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	Number	Number	Number	Number	Number	Number	Number	Number
Dollars per week								
\$15 or less	23	12	18	9	18	82	0	162
\$16 - \$25	25	41	31	37	53	216	3	406
\$26 - \$35	42	33	61	44	71	267	3	521
\$36 - \$45	31	30	27	27	50	137	7	309
\$46 - \$55	16	21	22	18	28	88	0	193
\$56 or more	7	13	9	16	10	49	0	104
Total	144	150	168	151	230	839	13	1,695

Family income	Percentage of families buying on -							Total
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Dollars per week								
\$15 or less	14.2	7.4	11.1	5.6	11.1	50.6	.0	100.0
\$16 - \$25	6.2	10.1	7.6	9.1	13.1	53.2	.7	100.0
\$26 - \$35	8.1	6.3	11.7	8.4	13.6	51.3	.6	100.0
\$36 - \$45	10.0	9.8	8.7	8.7	16.2	44.3	2.3	100.0
\$46 - \$55	8.3	10.9	11.4	9.3	14.5	45.6	.0	100.0
\$56 or more	6.7	12.5	8.7	15.4	9.6	47.1	.0	100.0
Total	8.5	8.8	9.9	8.9	13.6	49.5	.8	100.0

A classification by income groups in table 12 indicates the marketing habits of families as related to their economic status. Saturday was the most popular marketing day for all income groups, but the percentages show that families whose weekly incomes were \$35 or less were more likely to buy potatoes on Saturday than were families in the higher income groups. Possibly some of the latter families, who enjoyed more adequate income and were not as interested in week-end specials, did their marketing on other week days avoiding crowded markets and keeping Saturday afternoons and evenings free for recreation.

The reasons why over 60 percent of the Boston potato purchases were made on Friday and Saturday may be important. More important, however, from the point of view of potato producers and their marketing organizations is the fact that so large a part of the weekly potato business in Boston flows through the retail stores in 2 days at the end of the week. This is a significant feature of the retailer service problem and one which a marketing agency interested in retailer and consumer service must take into account.

USE OF POTATOES AT MEALS

To determine the number of meals at which potatoes were served by the different population groups, each of the consumers interviewed was asked the number of meals at which potatoes were served during the 7 days previous to the date of interview. The answers were tabulated according to the particular meal at which the potatoes were served, as the morning meal, the noon meal, or the evening meal. Sometimes it was difficult for a consumer to remember exactly what meals had included potatoes for a period as long as 7 days. However, 1,709 records were completed, representing the same number of family weeks of potato use. Each family record for each meal was classified according to whether potatoes were used in 1 to 3 meals out of the week or in 4 to 7 meals. The first group represents occasional use of potatoes; the latter group represents the more frequent users, a large proportion of whom used potatoes every day. In the first, or 1- to 3-meal group, the use of potatoes was relatively infrequent indicating that in this group substitution was more generally practiced.

In the 1- to 3-meal group, the Italians reported the largest percentage of families using potatoes at the morning meal. Table 13 shows that almost 26 percent of the Italians reported some use of potatoes for breakfast, but in the group using potatoes four to seven meals a week the percentage of Italians was very small. In this group the Irish were most frequently represented. Use of potatoes at breakfast was reported by the Jewish population in smaller percentages, in both the 1- to 3-meal and the 4- to 7-meal group. About 86 percent of the families reporting indicated they did not use potatoes for breakfast, and only 1.9 percent were classified as frequent users.

Table 13.- Families That Served Potatoes at the Morning Meal, by Number of Days Served During the Week and by Race or Nationality Groups, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Families serving potatoes at -				Total	Percentage of families serving potatoes at -				Total	
	1-3 meals	4-7 meals	No meals			1-3 meals	4-7 meals	No meals			
	Number	Number	Number		Number	Percent	Percent	Percent		Percent	Percent
Irish	43	12	301		356	12.1	3.4	84.5		100.0	100.0
Italian	47	2	134		183	25.7	1.1	73.2		100.0	100.0
Jewish	6	1	95		102	5.9	1.0	93.1		100.0	100.0
Negro	10	1	53		64	15.6	1.6	82.8		100.0	100.0
Unclassified white	103	16	885		1,004	10.3	1.6	88.1		100.0	100.0
Total	209	32	1,468		1,709	12.2	1.9	85.9		100.0	100.0

Table 14.- Families That Served Potatoes at the Morning Meal, by Number of Days Served During the Week and by Size of Family, Boston, Mass., March 4 to April 6, 1940

Persons in family	Families serving potatoes at -				Total	Percentage of families serving potatoes at -				Total	
	1-3 meals	4-7 meals	No meals			1-3 meals	4-7 meals	No meals			
	Number	Number	Number		Number	Percent	Percent	Percent		Percent	Percent
1	1	1	34		36	2.8	2.8	94.4		100.00	100.00
2	30	4	318		352	8.5	1.1	90.4		100.00	100.00
3	28	5	338		371	7.6	1.3	91.1		100.00	100.00
4	51	8	309		368	13.8	2.2	84.0		100.00	100.00
5	40	7	208		255	15.7	2.7	81.6		100.00	100.00
6	27	5	111		143	18.9	3.5	77.6		100.00	100.00
7	10	1	74		85	11.8	1.2	87.0		100.00	100.00
8 or more	22	1	76		99	22.2	1.0	76.8		100.00	100.00
Total	209	32	1,468		1,709	12.2	1.9	85.9		100.00	100.00

When classified according to size of family, as in table 14, the percentage of users in the 1- to 3-meal group increased with the number of persons per family. This increased percentage of using families may be explained largely by decreased income per capita as the number of persons per family increased. The fact that it apparently did not occur to the same extent in the 4- to 7-meal group where its presence would be equally probable seems to throw some doubt on this conclusion. However, it must be remembered that in the very-large-family group Italians were heavily represented and table 13 has shown that, although a large percentage of Italian families used potatoes for breakfast, they were in the 1- to 3-meal group and not among the more frequent users. Therefore, the presence of large proportions of Italians in the large family group partly explains the increase in the percentage of 1- to 3-meal users and the failure of the percentages in the other group to show a similar increase.

A contributing reason for the increased use of potatoes at breakfast in the larger families may lie in the competition between food products. The changes in dietary habits on the part of the population, associated with change in the type of employment, have been noted by many authorities on the subject. In this change, one of the important trends has been the increased use of prepared breakfast food and fruit juices at breakfast. Inasmuch as many of these newer ideas in breakfast menus include more expensive items, such as fruit juices or cream on the prepared breakfast foods, it seems reasonable to believe that to the extent that the pressure of economic circumstances in large families is an important factor governing consumption, the large families would be the last to give up the older and less expensive breakfast menus including potatoes. If it be true that there has been a shift away from the consumption of potatoes at breakfast and that this shift has been more important in small than in large families, then the morning meal may be one point at which potato consumption has declined in favor of competing products. This may to some extent be a key to the reason for declining consumption of potatoes on a per capita basis. The absence of data similar to those presented here for earlier periods prevents a definite conclusion on this point at present. The importance of economic circumstances as a factor explaining the use of potatoes is further shown in table 15, where reporting families were classified on the basis of family income. In this table the declining use of potatoes for breakfast at 1 to 3 meals per week as family income increased is definitely shown. Equally positive is the fact that the percentage of families reporting no potatoes at any breakfast meal increased steadily as income increased.

Another point of interest attached to tables 13, 14, and 15 is that most of the Boston consumers using potatoes at breakfast fell in the group which used them only 1 to 3 meals per week. Earlier it was indicated that in this group habit and custom was

Table 15.- Families That Served Potatoes at the Morning Meal, by Number of Days Served During the Week and by Income Groups, Boston, Mass., March 4 to April 6, 1940

Family income per week	Families serving potatoes at -			Total
	1-3 meals	4-7 meals	No meals	
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
\$15 or less	28	4	128	160
\$16 - \$25	72	7	319	398
\$26 - \$35	63	9	453	525
\$36 - \$45	31	6	276	313
\$46 - \$55	12	5	187	204
\$56 or more	3	1	105	109
Total	209	32	1,468	1,709
Family income per week	Percentage of families serving potatoes at -			Total
	1-3 meals	4-7 meals	No meals	
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
\$15 or less	17.5	2.5	80.0	100.0
\$16 - \$25	18.1	1.8	80.1	100.0
\$26 - \$35	12.0	1.7	86.3	100.0
\$36 - \$45	9.9	1.9	88.2	100.0
\$46 - \$55	5.9	2.4	91.7	100.0
\$56 or more	2.8	0.9	96.3	100.0
Total	12.2	1.9	85.9	100.0

less fixed and substitution on the part of consumers was more easily accomplished. The much greater flexibility in percentages reported in this column than in the one representing use at 4 to 7 meals per week supports this conclusion. Its significance to potato producers and to potato-marketing organizations is rather important. It is in just such cases as these that consumer satisfaction plays a vital role. Consumers in this 1- to 3-meal group presumably have experience in the use of food items other than potatoes for breakfast. If for any reason they become dissatisfied with potatoes, it is relatively easy for them to shift to the use of some other commodity. On the other hand, the more their satisfaction with the quality or the variety of potatoes is increased, the less will be the tendency to discontinue their use. Producers, therefore, in their production practices and through their marketing organizations should consider factors which influence consumer satisfaction and contribute to greater stability in consumers' use of their products. It is to this extent that the consumer's problem in buying and using products which give satisfaction is also the producer's marketing problem.

At the noon meal a larger percentage of the Jewish people reported the use of potatoes, but this was only in the 1- to 3-meal group. Among the more frequent users of potatoes the percentage of Jewish families reporting was small and the larger percentage was reported by the Negroes. Both of these groups reported the use of potatoes at breakfast by a very small percentage of families. The use of potatoes at noon was reported by a very much larger proportion of the families interviewed than was the case at breakfast, and whereas 86 percent of the families reported non-use of potatoes at breakfast only 37 percent reported nonuse of potatoes at noon, as indicated in table 16. The largest percentage of noon users was still found in the 1- to 3-meal group.

When classified on the basis of number of persons per family, as shown in table 17, a slight tendency for the percentage of persons eating potatoes at 1 to 3 meals per week to decline as size of family increased was indicated. This was explained mostly by the fact that some small families ordinarily eating away from home prepared their Sunday noon meal at home and included potatoes. This practice on the part of many consumers accounted for almost all the apparent decline in consumption with increase in size of family noted in table 17. As a matter of fact, when the number of families reporting use at only 1 meal per week was subtracted from the number reporting 1 to 3 meals, the change with size of family was completely removed. In the 4- to 7-meal group, however, there was a change in the opposite direction, and the percentage of families reporting use of potatoes at the noon meal increased as size of family increased. This is continued evidence of the relationship noted previously; that is, the number of meals in which potatoes were included increased as size of family increased and probably is related to the increased financial pressure associated with the increased number of persons per family.

When related to income, as shown in table 18, the proportion of users in both groups at the noon meal decreased as income increased.

It seems probable that this income-associated change in the percentage of families using potatoes at noon reflects the changes in dietary habits of consumers referred to above. With higher incomes, families were able to have a larger variety of food products. Such families probably substituted these competing food products for potatoes at noon meals more than in previous years when the large variety of fresh fruits and vegetables, now found in most markets, was not available. The increase in the volume of fruits and vegetables now produced and marketed as compared with earlier years is a matter of record. The custom of serving a light meal at noon, frequently including a salad, encourages the use of a variety of fruits and vegetables by those who can afford them. Potato producers should look for opportunities to extend the use of their product by study in the field of changing dietary habits.

Of the families reporting use of potatoes, only 4.4 percent reported nonuse at the evening meal, whereas 73.2 percent reported use at 4 to 7 meals per week (table 19). In the latter group the Irish were outstanding, 90.2 percent of them reporting frequent use of potatoes; Italians were at the other extreme, only 65 percent reporting in the 4- to 7-meal group. When classified by size of

Table 16.- Families That Served Potatoes at the Noon Meal, by Number of Days Served During the Week and by Race or Nationality Groups, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Families serving potatoes at -			Total
	1-3 meals	4-7 meals	No meals	
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
Irish	100	119	137	356
Italian	72	47	64	183
Jewish	45	19	38	102
Negro	16	26	22	64
Unclassified white	391	240	373	1,004
Total	624	451	634	1,709
Race or nationality	Percentage of families serving potatoes at -			Total
	1-3 meals	4-7 meals	No meals	
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Irish	28.1	33.4	38.5	100.0
Italian	39.3	25.7	35.0	100.0
Jewish	44.1	18.6	37.3	100.0
Negro	25.0	40.6	34.4	100.0
Unclassified white	38.9	23.9	37.2	100.0
Total	36.5	26.4	37.1	100.0

family as in table 20 no trend in percentages of families reporting was apparent in either group, but when classified according to income, as in table 21, the results were different. It was seen that the percentage of families reporting use at 1 to 3 meals per week declined as incomes increased; whereas, in the 4- to 7-meal group, the percentage increased as incomes increased. The evidence in the income relationship to the use of potatoes at the evening meal is that regardless of amounts used per family, or per person, the likelihood of inclusion of potatoes in this evening meal was greater as family incomes increased. This probably reflects the effect of habit and custom as dictating the inclusion of potatoes in the main meal of the day, regardless of the competition from other fruit and vegetable items as indicated at the morning and noon meals, and as indicated in other tabulations in connection

with this data. The income-associated increase shows that whenever incomes were sufficient, potatoes were included at the main meal of the day regardless of the variety of other foods also made available. It shows that a larger percentage of families used potatoes regularly at the evening meal among families in higher income groups. This does not mean that in this population group consumption of potatoes was highest, nor does it mean that purchases were largest. It means merely that the higher the income group the more consistently were potatoes purchased and made available at the evening meal.

There may be some relationship between use of potatoes at one meal and inclusion in the meal following. Such relationships, if they exist, may be important as affecting the actual quantity of potatoes consumed per capita. Further study of this problem, however, will be reserved for a later release.

Table 17.- Families That Served Potatoes at the Noon Meal, by Number of Days Served During the Week and by Size of Family, Boston, Mass., March 4 to April 6, 1940

Persons in family	Families serving potatoes at -			Total
	1-3 meals	4-7 meals	No meals	
	Number	Number	Number	Number
1	14	10	12	36
2	137	53	157	352
3	132	86	153	371
4	139	90	139	368
5	101	75	79	255
6	44	56	43	143
7	21	36	28	85
8 or more	36	40	23	99
Total	624	451	634	1,709
Persons in family	Percentage of families serving potatoes at -			Total
	1-3 meals	4-7 meals	No meals	
	Percent	Percent	Percent	Percent
1	38.9	27.8	33.3	100.0
2	38.9	16.5	44.6	100.0
3	35.6	23.2	41.2	100.0
4	37.8	24.4	37.8	100.0
5	39.6	29.4	31.0	100.0
6	30.8	39.1	30.1	100.0
7	24.7	42.4	32.9	100.0
8 or more	36.4	40.4	23.2	100.0
Total	36.5	26.4	37.1	100.0

Table 18.- Families That Served Potatoes at the Noon Meal, by Number of Days Served During the Week and by Income Groups, Boston, Mass., March 4 to April 6, 1940

Family income per week	Families serving potatoes at -				Total Number	Percentage of families serving potatoes at -				Total Percent
	1-3 meals		4-7 meals			1-3 meals		4-7 meals		
	Number	Percent	Number	Percent		Number	Percent	Number	Percent	
\$15 or less	65		27		160	40.6	42.5	16.9	100.0	
\$16 - \$25	167		113		398	42.0	29.6	28.4	100.0	
\$26 - \$35	197		200		525	37.5	24.4	38.1	100.0	
\$36 - \$45	97		140		313	31.0	24.3	44.7	100.0	
\$46 - \$55	68		93		204	33.3	21.1	45.6	100.0	
\$56 or more	30		61		109	27.5	16.5	56.0	100.0	
Total	624		634		1,709	36.5	26.4	37.1	100.0	

Table 19.- Families That Served Potatoes at the Evening Meal, by Number of Days Served During the Week and by Race or Nationality Groups, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Families serving potatoes at -				Total Number	Percentage of families serving potatoes at -				Total Percent
	1-3 meals		4-7 meals			1-3 meals		4-7 meals		
	Number	Percent	Number	Percent		Number	Percent	Number	Percent	
Irish	20		321		15	5.6	90.2	4.2	100.0	
Italian	56		119		8	30.6	65.0	4.4	100.0	
Jewish	27		70		5	26.5	68.6	4.9	100.0	
Negro	13		45		6	20.3	70.3	9.4	100.0	
Unclassified white	181		782		41	18.0	77.9	4.1	100.0	
Total	297		1,337		75	17.4	78.2	4.4	100.0	

Table 20.- Families That Served Potatoes at the Evening Meal by Number of Days Served During the Week and by Size of Family, Boston, Mass., March 4 to April 6, 1940

Persons in family	Families serving potatoes at -				Total	Percentage of families serving potatoes at -				Total
	1-3 meals		4-7 meals			1-3 meals		4-7 meals		
	Number	No meals	Number	No meals	Number	Percent	Percent	Percent	Percent	Percent
1	7		23	6	36	19.4	63.9	16.7	100.0	
2	68		261	23	352	19.3	74.2	6.5	100.0	
3	52		304	15	371	14.0	81.9	4.1	100.0	
4	62		296	10	368	16.8	80.5	2.7	100.0	
5	54		192	9	255	21.2	75.3	3.5	100.0	
6	18		122	3	143	12.6	85.3	2.1	100.0	
7	14		67	4	85	16.5	78.8	4.7	100.0	
8 or more	22		72	5	99	22.2	72.7	5.1	100.0	
Total	297		1,337	75	1,709	17.4	78.2	4.4	100.0	

Table 21.- Families That Served Potatoes at the Evening Meal, by Number of Days Served During the Week and by Income Groups, Boston, Mass., March 4 to April 6, 1940

Family income per week	Families serving potatoes at -				Total Number	Percentage of families serving potatoes at -				Total Percent
	1-3 meals		4-7 meals			1-3 meals		4-7 meals		
	Number	No meals	Number	No meals	Number	Percent	Percent	Percent	Percent	
\$15 or less	33		111	16	160	20.6	69.4	10.0	100.0	
\$16 - \$25	81		300	17	398	20.3	75.4	4.3	100.0	
\$26 - \$35	98		404	23	525	18.6	77.0	4.4	100.0	
\$36 - \$45	42		260	11	313	13.4	83.1	3.5	100.0	
\$46 - \$55	28		171	5	204	13.7	83.8	2.5	100.0	
\$56 or more	15		91	3	109	13.8	83.5	2.7	100.0	
Total	297		1,337	75	1,709	17.4	78.2	4.4	100.0	

METHODS OF PREPARATION

Additional explanation of consumers' preference for potatoes may be found in the methods of preparation for use. The Boston householders reported use of potatoes at 539 morning meals, 3,644 noon meals, and 8,624 evening meals during the period under consideration. These potatoes were prepared by various methods as reported in table 22. Here it is shown that potatoes served for breakfast were mostly fried. At noon large percentages of families reported their use boiled, baked, or mashed, but mostly boiled. At the evening meal, however, the largest percentage of families reported the use of baked potatoes.

The use of potatoes by Boston families at 8,624 evening meals is summarized in tables 23 to 25. Table 23 shows that Italian families served boiled potatoes and the Unclassified White group served baked potatoes at the highest percentages of evening meals. Mashed potatoes were served by a larger percentage of the Jewish population than of any other group, and the Negroes served fried potatoes at a larger percentage of meals than did other groups.

As the size of families increased the percentages of meals reported in each "preparation" group showed a tendency to change. A larger percentage of small families reported preparation of baked potatoes, whereas a larger percentage of large families reported boiling them. This may be partly explained as the extension of the Italian preference for boiled potatoes (table 24) into the large families where Italians were strongly represented. Hincks, reporting on consumer preferences said, "There was apparently some reason

Table 22.- Methods of Preparing Potatoes at the Morning, Noon, and Evening Meals, Boston, Mass., March 5 to April 6, 1940

Meal	Times served						Total
	Boiled	Baked	Mashed	Fried	French Fried	Others	
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
Morning	3	12	6	467	49	2	539
Noon	1,202	1,041	863	444	41	48	3,644
Evening	2,514	2,987	1,603	1,113	286	121	8,624

Meal	Percentage of servings in indicated form						Total
	Boiled	Baked	Mashed	Fried	French Fried	Other-wise	
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Morning	.6	2.2	1.1	86.6	9.1	.4	100.0
Noon	33.0	28.6	23.8	12.2	1.1	1.3	100.0
Evening	29.2	34.6	18.6	12.9	3.3	1.4	100.0

Table 23.- Methods of Preparing Potatoes for the Evening Meal, by Race or Nationality Groups, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Meals served during week						Total
	Boiled	Baked	Mashed	Fried	French Fried	Others	
	Number	Number	Number	Number	Number	Number	Number
Irish	602	638	380	311	52	22	2,005
Italian	265	226	155	101	24	15	786
Jewish	150	153	97	48	9	9	471
Negro	89	108	44	61	4	3	309
Unclassified white	1,408	1,857	927	592	197	72	5,053
Total	2,514	2,987	1,603	1,113	286	121	8,624

Race or nationality	Percentage of servings in indicated form						Total
	Boiled	Baked	Mashed	Fried	French Fried	Others	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Irish	30.0	31.8	19.0	15.5	2.6	1.1	100.0
Italian	33.7	28.8	19.7	12.8	3.1	1.9	100.0
Jewish	31.8	33.6	20.6	10.2	1.9	1.9	100.0
Negro	28.8	35.0	14.2	19.7	1.3	1.0	100.0
Unclassified white	27.9	36.3	18.3	11.7	3.9	1.4	100.0
Total	29.2	34.6	18.6	12.9	3.3	1.4	100.0

why, in large families, there was less preference for large size potatoes." 6/ Earlier in the same publication he said, "For boiling, smaller potatoes were acceptable." 7/ These two observations are consistent with and partly explained by the data in table 24. Large families use more boiled potatoes and, therefore, have less preference for large sizes than small families where more are served baked. Large families served mashed potatoes at a larger percentage of meals than did small families, but the contrary was reported in the percentage of meals at which fried potatoes were served.

When compared with incomes (table 25) the method of preparation assumes even greater significance. The percentage of families reporting "boiled" decreased with increasing income and the percentage "baked" increased with increasing income. There is no evidence that income was significantly related to preparation in any of the other forms.

The large percentage of meals at which potatoes were baked is of importance in the preparation of potatoes for marketing. The consumer's requirements for baking potatoes are more exacting than

6/ See page 33 of reference cited in footnote 1.

7/ See page 30 of reference cited in footnote 1.

Table 24.- Methods of Preparing Potatoes for the Evening Meal, by Size of Family, Boston, Mass., March 4 to April 6, 1940

Size of family	Meals per week						Total
	Boiled	Baked	Mashed	Fried	Fried French	Others	
	Number	Number	Number	Number	Number	Number	Number
1	38	64	24	24	4	1	155
2	435	663	286	212	50	31	1,677
3	582	660	367	253	50	26	1,938
4	543	638	366	251	63	30	1,891
5	416	436	222	175	49	12	1,310
6	226	244	149	107	32	8	766
7	130	162	96	45	12	7	452
8 or more	144	120	93	46	26	6	435
Total	2,514	2,987	1,603	1,113	286	121	8,624

Size of family	Meals per week						Total
	Boiled	Baked	Mashed	Fried	Fried French	Others	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1	24.5	41.3	15.5	15.5	2.6	.6	100.0
2	25.9	39.5	17.1	12.7	3.0	1.8	100.0
3	30.0	34.1	18.9	13.1	2.6	1.3	100.0
4	28.7	33.7	19.4	13.3	3.3	1.6	100.0
5	31.8	33.3	16.9	13.4	3.7	.9	100.0
6	29.5	31.9	19.4	14.0	4.2	1.0	100.0
7	28.8	35.8	21.2	10.0	2.7	1.5	100.0
8 or more	33.1	27.6	21.4	10.6	6.0	1.3	100.0
Total	29.2	34.6	18.6	12.9	3.3	1.4	100.0

Table 25.- Methods of Preparing Potatoes for the Evening Meal, by Income Groups, Boston, Mass., March 5 to April 6, 1940

Family income per week	Meals per week						Total
	Boiled	Baked	Mashed	Fried	Fried French	Others	
	Number	Number	Number	Number	Number	Number	Number
\$15 or less	247	198	117	106	15	7	690
\$16 - \$25	614	542	322	257	53	54	1,842
\$26 - \$35	755	909	563	317	116	20	2,680
\$36 - \$45	477	651	327	207	42	12	1,716
\$46 - \$55	295	433	173	132	45	25	1,103
\$56 or more	126	254	101	94	15	3	593
Total	2,514	2,987	1,603	1,113	286	121	8,624

Family income per week	Meals per week						Total
	Boiled	Baked	Mashed	Fried	Fried French	Others	
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
\$15 or less	35.8	28.7	16.9	15.4	2.2	1.0	100.0
\$16 - \$25	33.3	29.4	17.5	14.0	2.9	2.9	100.0
\$26 - \$35	28.2	33.9	21.0	11.8	4.3	.8	100.0
\$36 - \$45	27.8	37.9	19.1	12.1	2.4	.7	100.0
\$46 - \$55	26.7	39.2	15.7	12.0	4.1	2.3	100.0
\$56 or more	21.3	42.8	17.0	15.9	2.5	.5	100.0
Total	29.2	34.6	18.6	12.9	3.3	1.4	100.0

for potatoes for most other uses, both as to size and appearance. Reports on methods of preparation showed that this preference had a strong basis in each race or nationality group. Potatoes of good quality for either baking or boiling and sized and graded for baking would gain the greatest acceptance among Boston consumers if made available in satisfactory packages and at satisfactory prices.8/

8/ Some information on prices will be presented in a later release.

SUBSTITUTION FOR POTATOES

Producers of potatoes are confronted with the problem that the per capita consumption in the United States as a whole has declined continuously over a long period of years. The reason for this decline which is most popularly accepted is that consumers have been steadily but slowly substituting other food items for potatoes in their diets. Substitution as a marketing problem facing potato producers may be considered in several ways. For instance, the term itself suggests some regularity in use, otherwise substitution in the sense of displacement could not occur. In another sense, however, any meal at which potatoes were not used required the substitution of some other food item. A third characteristic of substitution is revealed when potatoes, although served and used at a meal, are used in smaller quantities because of the greater variety of other foods available.

Some evidence of the extent of substitution in one form is to be found in the number of meals at which potatoes are not used as indicated in tables 13 to 21 above. Further evidence may be found by enumerating reported substitutes in the sense of displacement. Still further indications of substitution are found in the number of other fruit and vegetable items purchased. These various aspects of the problem of substitution are discussed here only in the light of such data as are available from this study.

Substitution may be approached from the point of view of actual substitutes reported. Boston consumers were not always able to provide this information. The number of meals at which potatoes were not served, therefore, exceeded the number of substitutes reported. Baked beans were listed separately as a substitute for potatoes mainly because of their traditional use in Boston. Other vegetable items were combined. Several vegetable items were specifically reported as substituted for potatoes to the extent that potatoes were not served at the meal in question. They included parsnips, turnips, carrots, asparagus, tomatoes, greens of several kinds, cabbage, celery, corn, snap beans, and peas. Soups were also mentioned as substitutes for potatoes. In addition to these, several substitutes were reported which were classified as nonvegetable because of previous processing of the raw materials. These included macaroni, spaghetti, noodles, rice, cheese pie, pancakes, waffles, and bread.

As indicated, the extent of this direct and complete substitution is not completely shown because many consumers, able to say that potatoes had not been served, did not name a specific substitute. In many cases it seems probable that there was no easy and complete answer to the naming of such a substitute, since the whole meal may have been planned omitting potatoes.

The data showing substitutes at evening meals are summarized in table 26 by race or nationality groups. They indicate that baked beans were more important as substitutes among the Irish and unclassified white families than among other population groups. Vegetables other than baked beans were reported as substitutes for potatoes more frequently than were baked beans. The unclassified white and the Jewish families resorted to this substitution more than other groups. Italians reported "other substitutes" with relatively greater frequency than did the other race or nationality groups, and the Jewish group was second in this respect. On the average, potatoes were displaced by "other substitutes" more frequently than by baked beans or other vegetables.

There was no well-defined tendency (table 27) for proportions of the population to make substitutions, as associated with family size, as the high percentage of substitutions in the large-family group represented mostly reports from the large proportion of Italians in that group.

On the basis of family incomes (table 28), however, relationships are indicated for vegetables and for "other substitutes." Substitution of vegetables was most prevalent in the middle income groups. This suggests that families with small incomes found the substitution of fresh vegetables for potatoes costly, families in the middle income groups were able to make the substitutions, and families with higher incomes used the fresh vegetables but did not eliminate the potatoes from the menu. There was a tendency toward less use of "other substitutes" the data showed as income rose (the reverse of vegetable substitution) until the \$40 average group was reached, after which incomes seemed to have no further significance.

Table 26.- Substitution for Potatoes at Evening Meal, by Race or Nationality, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Percentage of meals at which substitutes were used				All meals served
	Baked beans	Vegetables excluding baked beans	Other substitutes	Total meals substituted	
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Number</u>
Irish	2.3	1.6	3.1	7.5	2,387
Italian	1.1	2.4	16.8	20.3	1,225
Jewish	1.0	7.5	6.9	15.4	679
Negro	.7	---	3.2	3.9	406
Unclassified white	2.9	6.4	3.6	12.9	6,741
Total	2.5	4.8	5.1	12.4	11,438 1/2

1/ 1,634 families reported using potatoes at one or more evening meals during a week. This, applied to evening meals for 7 days, represented a total of 11,438 meals served.

Table 27.- Substitution for Potatoes at Evening Meal, by Size of Family, Boston, Mass., March 4 to April 6, 1940

Persons in family	Meals substituted				All meals served
	Baked beans	Vegetables excluding baked beans	Other substitutes	Total meals substituted	
	Percent	Percent	Percent	Percent	Meals
1	--	4.7	.5	5.2	210
2	2.4	4.3	5.2	11.9	2,303
3	3.1	3.6	4.1	10.8	2,492
4	2.6	4.8	6.5	13.9	2,506
5	2.0	7.0	4.5	13.5	1,722
6	2.3	5.0	3.6	10.9	980
7	1.8	2.6	3.9	8.3	567
8 or more	2.9	7.4	9.1	19.4	658
Total	2.5	4.8	5.1	12.4	11,438 <u>1/</u>

1/ 1,634 families reported using potatoes at one or more evening meals during a week. This, applied to evening meals for 7 days, represented a total of 11,438 meals served.

Table 28.- Substitution for Potatoes at Evening Meal, by Income Groups, Boston, Mass., March 4 to April 6, 1940

Family income per week	Meals substituted				All meals served
	Baked beans	Vegetables excluding baked beans	Other substitutes	Total meals substituted	
	Percent	Percent	Percent	Percent	Meals
\$15 or less	2.4	3.2	7.1	12.7	1,008
\$16 - \$25	3.4	6.4	8.2	18.0	2,667
\$26 - \$35	2.2	7.5	4.3	14.0	3,514
\$36 - \$45	2.1	2.5	2.7	7.3	2,114
\$46 - \$55	2.6	2.0	3.8	8.4	1,393
\$56 or more	1.4	.8	3.9	6.1	742
Total	2.5	4.8	5.1	12.4	11,438 <u>1/</u>

1/ 1,634 families reported using potatoes at one or more evening meals during a week. This, applied to evening meals for 7 days, represented a total of 11,438 meals served.

As a whole, the Italians reported the use of substitutes at more meals than other groups, with the Jewish people second (table 26). The tendency for substitutions to increase as size of families increase was chiefly because very large families were mostly Italian and, as a rule, Italians do not have the same family size distribution as the remainder of the Boston population. Substitutions of other vegetables in both low and high income groups

were less than in the middle income groups because in low income groups substitution was too costly, and in high income groups additional food items were used instead of substitutes.

FRUIT AND VEGETABLE PURCHASES

Consumers were asked to check fruit and vegetable items purchased during the week previous to enumeration on a list of those available in the market at the time. These reported purchases were tabulated by groups of 5, that is, all reports listing 5 or less were grouped together, the next group was 6 to 10 items purchased, and so on, up to 21 or more. These groups were then reclassified by population groups. They show (table 29) that 9.6 percent of the Jewish and 6.4 percent of the unclassified Whites bought 21 or more fruit and vegetable items in the week preceding enumeration. All other race or nationality groups had a smaller percentage of representation. In the 16 to 20 item group the Irish and unclassified Whites were relatively most important. In the 11 to 15 item group, Jewish and unclassified Whites reported the largest percentage. Italians and Negroes had relatively much smaller representation in these larger number of item groups and were heavily represented in groups purchasing 10 items or less. At the present time no explanation is suggested for the variation shown by the Jewish group in the number of fruit and vegetable items purchased.

The classification of these purchases by size of family (table 30) was equally revealing. Small families were heavily represented in groups making few purchases but the difference in percentage representation was not evident beyond families of two. Apparently, it is not practical for small families to purchase a large number of items in a week, perhaps reflecting a difficulty which small family units experience in purchasing packages small enough for practical use.

Table 29.- Percentage of Families Purchasing Potatoes Within 1-7 Days, Classified by Number of Fruit or Vegetable Items Bought and by Race or Nationality, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Percentage of families purchasing -					Total
	5 items or less	6-10 items	11-15 items	16-20 items	21 or more items	
	Percent	Percent	Percent	Percent	Percent	Percent
Irish	5.0	33.2	38.2	19.5	4.1	100.0
Italian	8.9	54.5	22.0	12.2	2.4	100.0
Jewish	11.5	21.2	42.3	15.4	9.6	100.0
Negro	8.3	54.2	27.1	6.2	4.2	100.0
Unclassified white	4.1	28.6	42.7	13.2	6.4	100.0
Total	5.3	33.1	38.8	17.2	5.6	100.0

Table 30.- Percentage of Families Purchasing Potatoes Within 1-7 Days, Classified by Number of Fruit or Vegetable Items Bought and by Size of Family, Boston, Mass., March 4 to April 6, 1940

Persons in family	Percentage of families purchasing -					Total
	5 items or less	6-10 items	11-15 items	16-20 items	21 or more items	
	Percent	Percent	Percent	Percent	Percent	Percent
1	28.6	57.1	14.3	---	---	100.0
2	6.7	38.7	30.9	19.1	4.6	100.0
3	3.0	31.2	40.9	19.8	5.1	100.0
4	5.1	30.5	41.0	18.0	5.4	100.0
5	5.2	37.2	39.5	11.1	7.0	100.0
6	7.0	26.3	42.9	15.8	8.0	100.0
7	7.4	35.3	33.8	19.1	4.4	100.0
8 or more	3.7	30.9	43.2	17.3	4.9	100.0
Total	5.3	33.1	38.8	17.2	5.6	100.0

When classified by income groups (table 31), their relationship with fresh fruit and vegetable items purchased was most important. The proportion of families purchasing only 10 items per week or less decreased rapidly as family income increased, while those purchasing 16 or more increased as incomes increased. In the 11 to 15 item group, there is a rapid increase in percentage of families up to the \$40 group and a less rapid decrease after the \$40 group. This reflects the previously noted tendency for families with less income to use fresh fruit and vegetable items for substitutes while families with larger incomes add these items to the diet. The explanation of the smaller percentages after reaching an income of \$40 or more per week appears in the very rapid increases in percentage of such families reporting purchases of 21 items or more.

The information on substitution showed that it is an important marketing problem for potato producers. It showed that there were a large number of meals at which potatoes were not served. It also showed a rather imposing array of food items which were on occasion substituted for potatoes in the family diet. Further, it indicated that even in families which used potatoes regularly there was partial substitution as indicated by the large number of other fruit and vegetable items which were purchased. Producers and their marketing organizations should, therefore, interest themselves in the consumer's satisfaction with their product, both as to palatability, which undoubtedly affects its standing and competition with other foods, and also in convenience factors such as size of package and quality and size of potatoes in the package. Such activities may have a tendency to reduce the substitution of other items for potatoes and at the same time place potatoes in a more permanent position in the average consumer's list of household food requirements.

Table 31.- Percentage of Families Purchasing Potatoes Within 1-7 Days, Classified by Number of Fruit or Vegetable Items Bought and by Income Groups, Boston, Mass., March 4 to April 6, 1940

Family income per week	Percentage of families purchasing -					Total
	5 items or less	6-10 items	11-15 items	16-20 items	21 or more items	
	Percent	Percent	Percent	Percent	Percent	Percent
\$15 or less	21.5	52.3	20.6	4.7	.9	100.0
\$16 - \$25	7.0	47.0	37.8	7.8	.4	100.0
\$26 - \$35	3.2	33.1	47.1	15.1	1.5	100.0
\$36 - \$45	1.6	22.1	46.3	23.7	6.3	100.0
\$46 - \$55	.8	16.9	29.4	36.0	16.9	100.0
\$56 or more	2.9	8.7	27.6	30.4	30.4	100.0
Total	5.3	33.1	38.8	17.2	5.6	100.0

ESTIMATED WEEKLY HOME USE OF POTATOES

This research did not include among its objectives the estimation of total consumption of potatoes either per family or per capita. Such an estimate, for instance, would include adjustments for meals eaten away from home and for the entertainment of guests within the home. It should also include amounts of potatoes, however small, produced by consumers in their home gardens or received from friends and relatives from similar sources. In addition, adjustments would have to be made for waste in preparation and from spoilage which occurred after the potatoes were brought into the home. It is not meant to infer that actual amounts of potatoes consumed by various population groups are not important marketing considerations. It was assumed, nevertheless, that other information already presented, as well as indications of the changes in amounts used by various population groups now under consideration, would serve as indices of the extent of differences which actually exist within the market.

The idea of weekly home use includes all means of disposal within the household. No attempt has been made to separate waste in preparation or deterioration from actual amounts consumed. The estimate itself, however, takes into consideration all the elements important to the consumer's choice of the product which, after all, are the factors most important to a marketing organization. For this reason, it is particularly applicable as an index to the problem at hand.

Consumers reporting a purchase more than 7 days before the date of enumeration were not included in this estimate. This exclusion of records requiring the memory of the date of purchase over a period longer than a week was made because it was felt that less errors would be recorded if data for only the past week were included and that, therefore, the estimate of weekly use would be more accurate. Since the estimate was prepared on the basis of the report of the

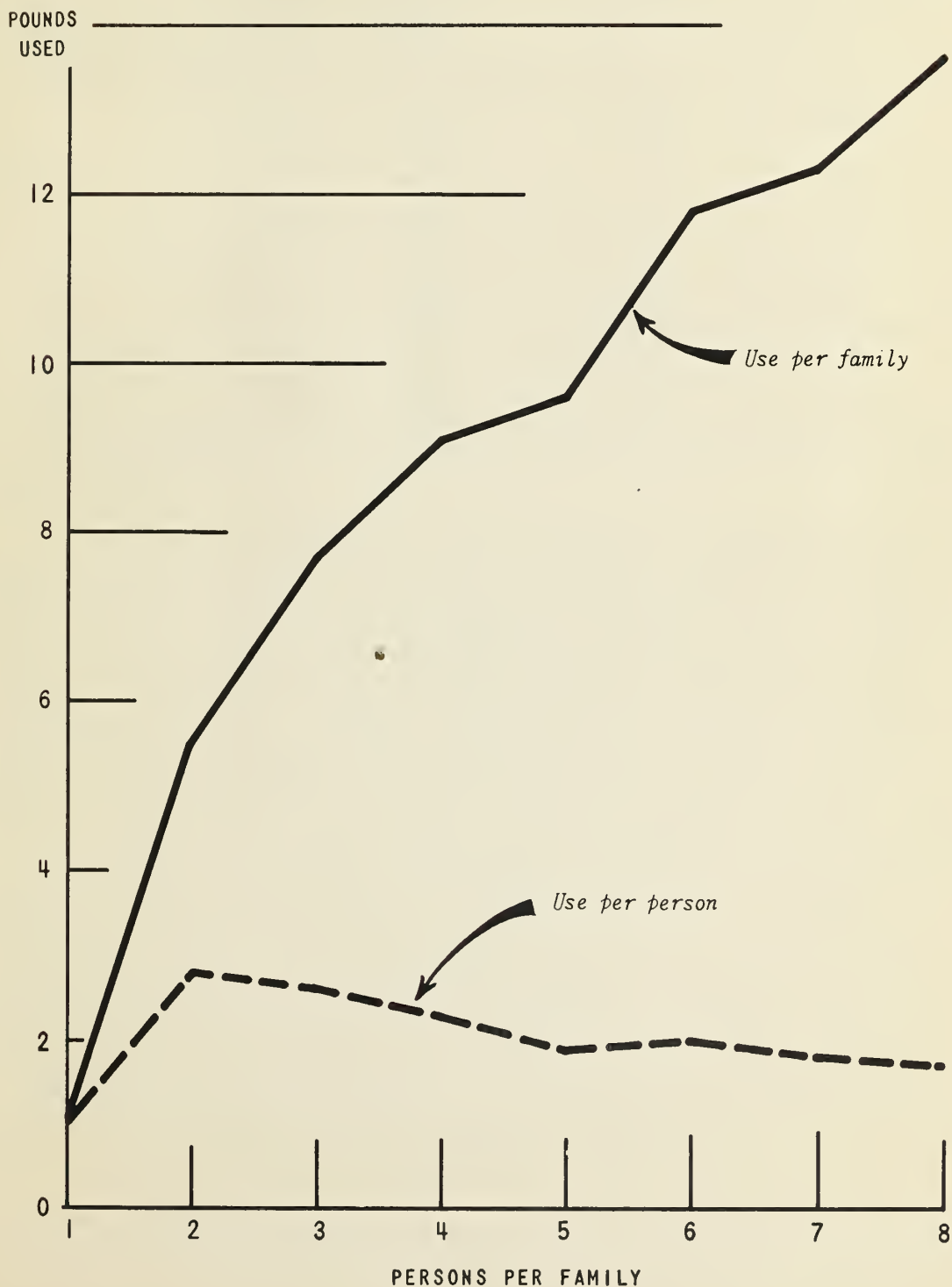
amount of the last purchase and the assumption that only one purchase was made within the last week, the estimate understates the true weekly use when consumers purchased potatoes more than once a week. Data have been presented, however, which show that the purchase of potatoes more than once a week probably occurred in relatively few families.

The average amount purchased was found by dividing the total quantity of purchases, within a period of 7 days or less preceding the interview, by the total number of families reporting such purchases. Since it is based on the last purchase, it is an understatement of the actual amount bought weekly for those families who buy more than once a week. In table 3 is the evidence that number of purchases were related to family size so strongly that more than once a week was only rarely indicated. Table 8 shows that in any case purchases more than once a week must be limited to less than 39.7 percent of the families, since all others purchased less than once a week. Tables 10, 11, and 12 show that about 63.1 percent of the consuming families made purchases on Friday or Saturday. If an important group purchased twice a week, then a secondary, although less important, purchase day would fall on Tuesday, Wednesday, or Thursday. There is some indication in table 11 that a few large families did this. In general, the evidence supports the idea that the majority of consumers bought once a week or less. About 63 percent of them purchased potatoes at the end of the week. Others purchased potatoes when their supply was exhausted and a few purchased more than once a week. The average weekly purchase, as here calculated, is slightly understated, probably more for the largest family group than any others.

The percentage of families making their last purchase within a 7-day period, the average number of pounds in this purchase, and the estimated home use tabulated according to size of family are shown in table 32. Each of these indications of use increased as the number of persons per family increased. However, the relationship between family size and average weekly home use was not directly proportional -- families of 8 persons did not use four times as many potatoes in a week as did families of 2 persons. This is illustrated in figure 2 by the upward slope of the line representing weekly use per family and by the downward slope for weekly use per capita. The principal reason for the small use by family units of one was that a large number of meals were eaten away from home. The large use per person in other small families may occur because it is impractical for such families to have a large number of food items in the home, and, therefore, more difficult for them to substitute as liberally in their diet.

A size of package, which is efficient for families of a certain number of persons, is not necessarily equally satisfactory for families of all sizes. This is illustrated in figures 3 and 4, for the

FIGURE 2
ESTIMATED AVERAGE HOME USE OF POTATOES WEEKLY,
PER FAMILY AND PER PERSON, IN BOSTON,
MARCH 4 TO APRIL 6, 1940



two most popular packages for potatoes, the 15-pound or peck-package and the 7-1/2 pound or one-half peck package.

Table 32.- Percentage of Families Purchasing in any Week, Estimated Average Weekly Purchase, and Estimated Weekly Home Use of Potatoes, by Size of Family, Boston, Mass., March 4 to April 6, 1940

Number of persons in family	Percentage buying within any week	Estimated average weekly purchase <u>1/</u>	Estimated weekly home use, all users	Estimated weekly home use per capita
	<u>Percent</u>	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>
1	19.4	5.2	1.0	1.0
2	55.1	10.0	5.5	2.8
3	64.5	12.0	7.7	2.6
4	69.1	13.2	9.1	2.3
5	68.8	13.9	9.6	1.9
6	77.7	15.2	11.8	2.0
7	79.1	15.6	12.3	1.8
8 or more	78.6	17.3	13.6	1.7
Total	66.1	13.2	8.7	2.2

1/ Understates the true amount for families purchasing more than once a week.

The relative popularity of these packages is reflected by the fact that 66.5 percent of the 1,133 families who bought potatoes within a week bought them in 15-pound packages, while 17.1 percent bought them in the 7-1/2 pound packages; in other words, 83.6 percent of the purchases were in packages of these two sizes. The question arises do these percentages apply when the families are classified by size? In figure 3 the ratio (66.5) for all families buying pecks within a week, is represented by the solid line. The allowance for accidental error which may arise through the use of the sampling method is indicated by the area between two broken lines. If in each size-of-family group 66.5 percent of the families purchased pecks, the point representing that group would fall exactly upon the solid line, indicating perfect agreement; if they fall between the two broken lines, the differences from 66.5 percent are not important enough to be considered significant. If a size-of-family group falls outside the broken lines, it indicates a strong probability that either more or fewer than 66.5 percent of the families of that particular size bought the peck package within a week. The same procedure is followed in figure 4, where the solid line indicates that 17.1 percent of the families that bought within a week bought the 7-1/2 pound or half-peck package. The data on which figures 3 and 4 are based appear in table 33.

Table 33.- Number of Families Purchasing Various Quantities of Potatoes, Within Last 7 Days, Classified by Size of Family, Boston, Mass., March 4 to April 6, 1940 ^{1/}

Persons in family	Families purchasing -					Total
	1 - 6 pounds	7 - 8 pounds	9 - 14 pounds	15 pounds	16 or more pounds	
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
1	4	3	--	--	--	7
2	56	55	6	76	1	194
3	25	55	12	146	2	240
4	17	46	8	184	1	256
5	13	22	3	132	2	172
6	6	7	1	95	6	115
7 or more	5	6	5	121	12	149
Total	126	194	35	754	24	1,133
Percentage of total	<u>Percent</u> 11.2	<u>Percent</u> 17.1	<u>Percent</u> 3.1	<u>Percent</u> 66.5	<u>Percent</u> 2.1	<u>Percent</u> 100.0

^{1/} This table shows that for some groups the number of family reports was few. For this reason some family size groups were combined in estimating home use.

Figure 3 shows that it is unlikely that 66.5 percent of the families of 1 and 2 persons bought peck packages within a week, but that more than 66.5 percent of the families of 5 or more persons were likely to purchase this quantity within a week. In figure 4, where purchases of half pecks are being studied, the opposite is seen; the small families bought a high percentage and families of 6 and 7 or more a low percentage of these packages when compared with the average of 17.1 percent. The data illustrated in figures 3 and 4 are in accord with the general expectation, previously commented upon, that small families tend to buy relatively small packages of potatoes, and that the greatest demand for peck packages comes from medium and large families.

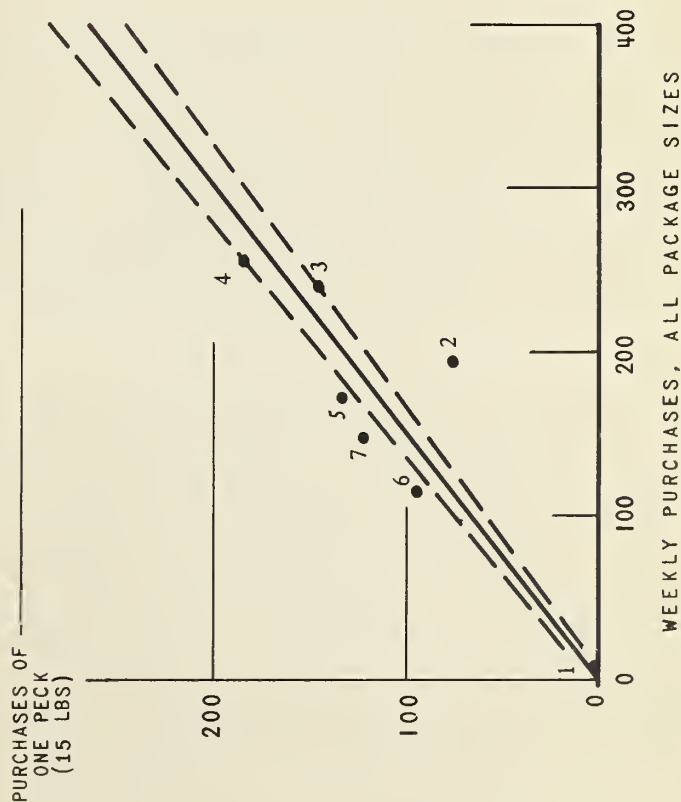
It appears from table 33 that certain differences in the quantities of potatoes purchased were associated with size of family. Other such differences seemed to be associated with race or nationality. On a per capita basis, table 34 shows by race or nationality the estimated average weekly purchase within 7 days of the date of interview. The estimated average home use per person for the families that reported the use of potatoes in their homes is shown in table 35.

If race or nationality were not associated with the average size of the weekly purchase, it could be assumed that all families of a certain size would use approximately the same quantity of potatoes within a week, regardless of whether these families were

FIGURE 3

WEEKLY PURCHASES IN 15 POUND PACKAGES AS RELATED TO
WEEKLY PURCHASES IN PACKAGES OF ALL SIZES,
BY SIZE OF FAMILY GROUPS

The solid line represents the probability that 66.5 percent of all purchases were pecks as was indicated by the total sample. Numbers beside dots in the diagram indicate size of family group.

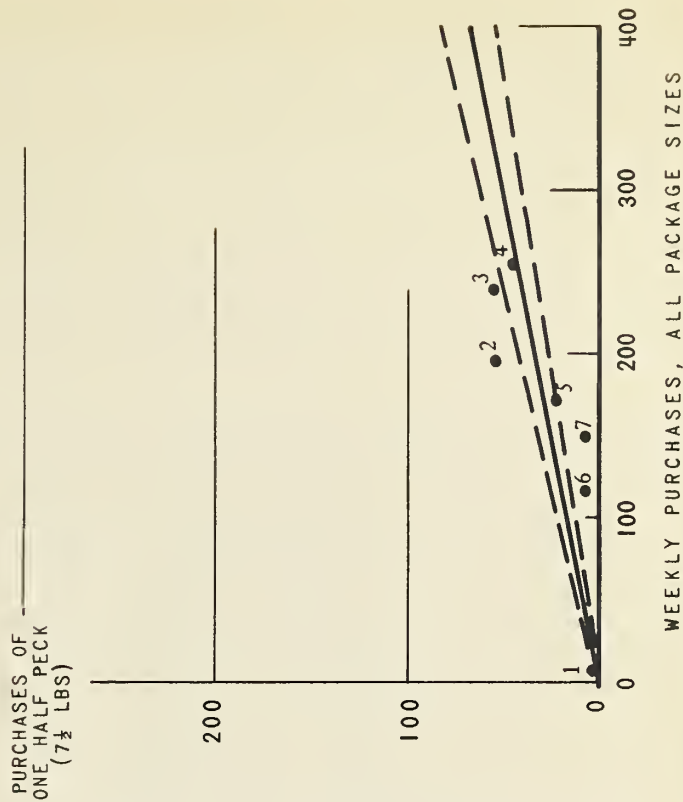


When the average probability or percentage of any family size group making a purchase is so far removed from the probability for the whole sample that it falls outside the dotted line on the diagram, a real difference between the particular family size group and the average for all families is strongly suggested.

FIGURE 4

WEEKLY PURCHASES IN 7½ POUND PACKAGES AS RELATED TO
WEEKLY PURCHASES IN PACKAGES OF ALL SIZES,
BY SIZE OF FAMILY GROUPS

The solid line represents the probability that 17.1 percent of all purchases were half pecks as was indicated by the total sample. Numbers beside dots in the diagram indicate size of family.



Irish, Jewish, or of some other racial or national origin. Thus, the home use per person in all families of two persons would be about 2.7 pounds per week, and this use per person in families of three and four persons would be about 2.3 pounds per week. Examination of the data in tables 34 and 35, however, show that this is not true, for there are differences by race or nationality both in the average weekly purchases and in the estimated average use per capita. Table 34 shows that the average weekly purchase by Negroes is consistently below the average for all groups. Table 35 shows that when adjustments were made for the fact that the Jewish families usually purchase less frequently than others, the average weekly home use in this group was lower than for any other group.

Table 34.- Quantity of Potato Purchases Per Capita in Families Buying Potatoes each Week, by Race or Nationality, in Size of Family Groups 1/, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Per capita purchase each week in families of -			
	2 persons	3 and 4 persons	5 and 6 persons	7 or more persons
	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>
Irish	5.3	3.7 (3.9)	2.8	1.9
Italian	4.2	3.0	2.3	1.7 (2.6)
Jewish	4.7	3.4	2.5 (3.4)	1.7
Negro	4.2	2.6	1.8	1.6
Unclassified white	5.0	3.7 (3.8)	2.6 (2.8)	2.0
Total	4.9	3.5 (3.6)	2.6 (2.7)	1.9 (2.2)

1/ Seven purchases of 100 pounds or more were reported. The inclusion of one of these large purchases in any population group was sufficient to increase the average for the group, as compared with other groups not including such a purchase. For purpose of comparison, group averages were adjusted to exclude purchases of 100 pounds or more. Figures in parentheses show the group averages before adjustment.

In table 36, are summarized the percentage of families purchasing in an average week, the average quantity purchased per week per family by race or nationality, and the estimated average weekly home use. Here it is shown that, although the average purchase by Jewish families was above the average for all families, their estimated home use was the lowest reported because the purchases were relatively infrequent. Among the Negroes, the small size of weekly purchase was compensated by frequency of purchase to the extent that the estimated average home use was higher than for the Jewish group. The Irish, on the other hand, were highest in average weekly purchase and purchased potatoes frequently enough to make their indicated average home use the highest of all the population groups.

Table 35.- Estimated Weekly Per Capita Home Use of Potatoes, by Race or Nationality and in Size of Family 1/, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Weekly per capita use in families of -			
	2 persons	3 and 4 persons	5 and 6 persons	7 or more persons
	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>
Irish	3.2	2.6 (2.7)	2.0	1.4
Italian	2.6	2.0	1.4	1.1 (1.7)
Jewish	1.3	1.9	1.6 (2.2)	.8
Negro	3.0	2.2	1.6	1.2
Unclassified white	2.7	2.4 (2.5)	1.9 (2.1)	1.7
Total	2.7	2.3 (2.4)	1.9 (1.9)	1.5 (1.7)

1/ Seven purchases of 100 pounds or more were reported. The inclusion of one of these large purchases in any population group was sufficient to increase the average for the group, as compared with other groups not including such a purchase. For purpose of comparison, group averages were adjusted to exclude purchases of 100 pounds or more. Figures in parentheses show the group averages before adjustment.

Table 36.- Percentage of Families Purchasing in any Week, Estimated Average Weekly Purchase, and Estimated Weekly Home Use of Potatoes by Race or Nationality, Boston, Mass., March 4 to April 6, 1940

Race or nationality	Percentage of families buying within any week	Estimated average weekly purchase <u>1/</u>	Estimated weekly home use, all users
	<u>Percent</u>	<u>Pounds</u>	<u>Pounds</u>
Irish	63.5	13.5	9.2
Italian	64.9	13.0	8.4
Jewish	51.5	13.8	7.1
Negro	75.0	9.9	7.4
Unclassified white	66.2	13.4	8.9
Total	66.1	13.2	8.7

1/ Understates the true quantity for families purchasing more than once a week.

In tables 37 and 38, quantities of potatoes purchased and used in different size-of-family groups are tabulated according to family income. They are not nearly as conclusive as those relating to race or nationality and size of family (tables 34 and 35). It seems, for instance, that in families of low income and of average size or smaller, there was a tendency for the average amount purchased weekly as well as the average home use to be larger than for other families. The extension of this tendency to other than the lower income groups, however, does not seem to be justified. In families of five and six persons it is doubtful whether any relationship can be shown, and in families of seven or more persons, there is some slight indication that the association with income may be in the opposite direction, the lowest-income families having the lowest consumption. Arrival at definite conclusions based on these data in this form is probably not justified. The more evident findings, however, are presented in this preliminary report for the benefit of those interested. Further study, however, will be necessary before definite conclusions can be reached.

The estimated average weekly purchase per family, is shown in table 39. This table also includes the estimated average weekly family home use, by income groups. These data, as classified according to income by average size of family with reference to the weekly purchase or the estimated home use, offer no more conclusive evidence of an actual difference associated with income than was indicated in tables 37 and 38. These data will be subjected to further analysis in the course of the study and reported later.

Table 37.- Estimated Weekly Purchases of Potatoes Per Capita by Families Purchasing Potatoes Weekly, and by Incomes in Size of Family Groups 1/, Boston, Mass., March 4 to April 6, 1940

Family income per week	Weekly per capita purchase in families of -			
	2 persons	3 and 4 persons	5 and 6 persons	7 or more persons
	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>
\$15 or less	6.3	3.6	2.5	1.6
\$16 - \$25	4.6	3.4 (3.6)	2.4	1.9 (2.7)
\$26 - \$35	5.0	3.7	2.6	1.9
\$36 - \$45	4.5	3.5 (3.8)	2.6 (3.0)	2.1 (2.7)
\$46 - \$55	4.1	3.4	2.7 (3.7)	1.9
\$56 or more	5.3	3.3	2.6	1.7
Total	4.9	3.5 (3.6)	2.6 (2.7)	1.9 (2.2)

1/ Seven purchases of 100 pounds or more were reported. The inclusion of one of these large purchases in any population group was sufficient to increase the average for the group, as compared with other groups not including such a purchase. For purpose of comparison, group averages were adjusted to exclude purchases of 100 pounds or more. Figures in parentheses show the group averages before adjustment.

Table 38.- Weekly Home Use Per Capita by Families Using Potatoes, by Incomes, in Size of Family Groups 1/, Boston, Mass., March 4 to April 6, 1940

Family income per week	Weekly per capita use in families of -			
	2 persons	3 and 4 persons	5 and 6 persons	7 or more persons
	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>
\$15 or less	3.9	2.9	2.0	1.2
\$16 - \$25	2.7	2.4 (2.5)	1.8	1.5 (2.1)
\$26 - \$35	2.5	2.4	1.9	1.5
\$36 - \$45	2.6	2.1 (2.3)	1.6 (1.9)	1.6 (2.0)
\$46 - \$55	1.9	2.4	2.1 (2.9)	1.6
\$56 or more	2.9	2.3	1.7	1.5
Total	2.7	2.3 (2.4)	1.9 (1.9)	1.5 (1.7)

1/ Seven purchases of 100 pounds or more were reported. The inclusion of one of these large purchases in any population group was sufficient to increase the average for the group, as compared with other groups not including such a purchase. For purpose of comparison, group averages were adjusted to exclude purchases of 100 pounds or more. Figures in parentheses show the group averages before adjustment.

Table 39.- Percentage of Families Purchasing in any Week, Estimated Average Weekly Purchase, and Estimated Weekly Home Use of Potatoes by Income Groups 1/, Boston, Mass., March 4 to April 6, 1940

Family income per week	Percentage of families buying within any week	Estimated average weekly purchase <u>1</u> /	Estimated weekly home use, all users
	<u>Percent</u>	<u>Pounds</u>	<u>Pounds</u>
\$15 or less	65.6	12.6	8.3
\$16 - \$25	69.2	12.8	8.9
\$26 - \$35	65.3	13.3	8.7
\$36 - \$45	61.2	14.1	8.6
\$46 - \$55	69.0	13.9	9.6
\$56 or more	65.1	12.2	7.9
Total	66.1	13.2	8.7

1/ Understates the true amount for families purchasing more than once a week.

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